REMARKS

In an Office Action dated April 17, 2008, the Examiner rejected claims 10-14 under 35 U.S.C. §101 as directed to non-statutory subject matter; rejected claims 1-3, 6, 7, 10-12, 15-17 and 20-27 under 35 U.S.C. §102(e) as anticipated by Yamashita (US Patent Publication 2002/0002578); and rejected claims 4, 5, 8, 9 13, 14, 18 and 19 under 35 U.S.C. §103(a) as unpatentable over *Yamashita* in view of Shi (US 6,757,897).

Claim Cancellations

Applicants have cancelled claims 1-5, 10-19 and 27, and the rejections of these claims are moot. These claims are being cancelled in order to place all method claims in one patent application and move other classes of statutory subject matter to a continuation application. Applicants intend to file a continuation claiming the cancelled subject matter, and does not hereby concede that any cancelled claim is not patentable over the cited art or the propriety of any other rejection of the cancelled claims.

Prior Art

Applicants have amended the remaining independent claims to clarify the nature of their invention. Specifically, all remaining independent claims have been amended to recite defining a respective valuation for each of a plurality of work items or programs, and comparing the respective valuation to a respective cost or fee. As amended, the claims are patentable over the cited art.

Applicants' invention relates to the scheduling of computer resources in an environment where at least some of the resources are fee-based, and it is desirable to minimize the fees for processing jobs. In an exemplary embodiment, an in-house computer system provides a limited amount of processing capability, and is connected to a fee-based distributed system in which

additional resources can be purchased on demand.   Other scenarios could involve environment in which fees vary by time of day/day of week, or vary according to how busy the system is.

   In such an environment, it is possible to simply purchase the needed computing resource whenever there is a job waiting. However, not all jobs are equal, and in such a situation there are typically some jobs which require immediate attention, while others can wait. Applicants note that, for each job, there is some theoretical corresponding value associated with having it done now as opposed to later. Applicants therefore propose to define a corresponding valuation for each job to the computer system, and to compare these valuations to the projected fee for processing the job now. If the fee exceeds the value, the job is deferred; if not, the job is scheduled for processing, and the resultant fee is incurred. It is expected that the valuations will vary, and some jobs may be scheduled while others are deferred.. By deferring less "valuable" jobs, greater flexibility is achieved to process these jobs at a time when the fees are lower, or when in-house computing resources are idle so that no fee is required.

   Therefore a significant feature of applicants' invention is that *a respective valuation* is associated with each of a plurality of work items/programs, and that this *valuation is compared to a respective cost* of the computing resources required to do the work, the scheduler managing access to the resources based on this comparison.

   The original independent claims did not fully recite these significant aspects, and the claims have therefore been amended to clarify the invention. Representative amended claim 6 recites:

6.   A computer-implemented method for managing access to computer resources, the
method comprising:
 defining a respective valuation of each of a plurality of work items to be processed
by one or more data processing systems;
 *comparing the respective valuation of each respective said work item to a
respective cost* of accessing additional computer resources necessary to process the work
item; and
 dynamically managing the access of additional computer resources by respective
ones of the work items *if the respective valuation of each of the work items exceeds the
respective cost* of accessing additional computer resources necessary to process
corresponding ones of the work items.   [emphasis added]

Independent claims 20 and 23 vary in scope, but all contain limitations analogous to the italicized
limitations above.

 Yamashita discloses a job scheduling mechanism for a parallel computer system having
multiple processing nodes. The scheduler has the capability to balance load by shifting jobs from
one processing element to another, and further has the capability to "freeze" and "unfreeze" jobs,
i.e., to write jobs state to auxiliary storage and retrieve it from storage to begin execution again.
Freezing is based on priority of jobs in the queue. In one aspect, *Yamashita* discloses that an
"execution cost" is computed for freezing and unfreezing jobs as part of the determination to
freeze. This execution cost is not a fee-based cost, but an execution time.

 The independent claims as amended are not anticipated by *Yamashita* because, inter alia,
Yamashita does not disclose that a valuation is associated with each work item, and that this is
compared to a cost. There is nothing in *Yamashita* that corresponds to a "valuation" associated
with each work item. Although an execution priority is associated with each work item,
Yamashita does not disclose that this execution priority is compared with a cost of resources
needed to process the work item. The execution priority of one job is simply used to compare it
with the execution priority of another job, to determine which of the two jobs should have

seniority. It is not used for any other purpose, and therefore does not meet the limitations of applicants claimed "valuation".

Furthermore, although *Yamashita* discloses an "execution cost, this "execution cost" is simply a determination whether total execution time will increase as a result of the overhead of rearranging jobs, as by freezing and unfreezing. This cost is not compared to any form of "valuation" associated with the individual jobs

For all of the reasons stated above, the claims as amended are not anticipated by *Yamashita*.

Nor are the amended claims obvious over *Yamashita.. Yamashita* is a mechanism for scheduling work using a parallel computing system. As such, *Yamashita* is directed to the task of attempting to maximize the performance of the parallel processing system. This is what is commonly known as load balancing. *Yamashita* does show the ability to defer jobs (by "freezing"), but the assumption is that available computing resources will be used to the fullest extent. Applicants' invention is directed preferably to an environment wherein available computing resources are, for all practical purposes, limited only by how much one is willing to pay for them. As disclosed in applicants' specification, it is not always desirable to utilize computing resources to the fullest extent possible, for that may incur undesirably high fees. Applicants take essentially a different approach, in which cost of computing resources governs scheduling. There is nothing in *Yamashita* to suggest this approach, nor is a rationale provided for one of ordinary skill in the art to construct one.

The secondary reference, *Shi*, similarly discloses a scheduling mechanism in which time slicing is used to avoid starvation of lower priority jobs. *Shi* is cited to show a mechanism for

prevention of starvation, but does not otherwise disclose or suggest the significant features of applicant's independent claims discussed above.

For all the reasons stated above, the claims are patentable over the cited art.

In view of the foregoing, applicants submit that the claims are now in condition for allowance and respectfully request reconsideration and allowance of all claims. In addition, the Examiner is encouraged to contact applicants' attorney by telephone if there are outstanding issues left to be resolved to place this case in condition for allowance.

Respectfully submitted,

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